

REMARKS

In accordance with the foregoing, various of the original claims 1-7 have been amended to improve form and without change of substance, and, further, new claims 8-18 have been added, all depending directly or indirectly from claim 1.

No new matter is presented and, accordingly, approval and entry of the foregoing amended and new claims are respectfully requested.

STATUS OF CLAIMS

Claims 1, 5 and 6 are rejected.

Claims 2-4 are objected to but are indicated to be allowable if suitably rewritten to independent form.

New claims 8-18 have been added. Claims 7, 12, and 17 are based on the description on page 13, line 30 to page 15, line 16 of the originally filed specification, and FIG. 9. Claims 8, 13, and 18 are based on the description on page 15, lines 2-5 of the originally filed specification. Claims 9, 11 and 14-16 are dependent claims corresponding to claims 2-4.

ITEM 3: REQUIREMENT FOR INFORMATION UNDER 37 USC § 1.105

Primary Document: "A Speaker Verification Method Which Can Control False Acceptance Rate" – Hayakawa et al.

In response to the first requirement of Item 3 in the Office Action, attached is a copy of a thesis "A Speaker Verification Method Which Can Control False Acceptance Rate" (Exhibit A) by the inventors of the present application. The thesis of the present invention was listed on page 2212-2220 of THE TRANSACTIONS OF THE INSTITUTE OF ELECTRONICS, INFORMATION AND COMMUNICATION ENGINEERS D-II, Vol. J82-D-II, No. 12, issued on December 25, 1999, by THE INSTITUTE OF ELECTRONICS, INFORMATION AND COMMUNICATION ENGINEERS. An English translation of a portion thereof related to the present invention is supplied as Exhibit B.

In the attached excerpts, from pages 8-11 and 19-22 of the specification and claims of the subject application, the underlined portions of the present application relate to the English-translated portions of the thesis. (Exhibit C)

Document Cited in Primary Document: S. Furui, "Cepstral analysis technique for automatic speaker verification," IEEE Trans. Acoust., Speech & Signal Process., Vol. ASSP-29, No. 2, pp. 254-272, April 1981 with the USPTO.

Furui is a document cited in the thesis, and a copy of Furui is also attached. (Exhibit D) Furui discloses a method for determining a threshold value using the average and standard deviation of the similarity between the template of a registered person in learning data and data on those other than the registered person (i.e., a method for considering only an FA (False Acceptance) rate with a relatively satisfactory estimation precision. The present invention is different from Furui in that an FA rate is given as a threshold value every time a voice is input.

Furui, supra, is not a document in the database search. Mr. Hayakawa, who is one of the inventors, happened to find it after filing of the Japanese application of the present invention (filing date: December 25, 1999), and described it in the above thesis. Therefore, there is no description based on Furui in the specification of the Japanese application.

Furthermore, upon finding Furui, Mr. Hayakawa was sure that the present invention is patentably apparently different from Furui, so that Mr. Hayakawa et al. did not mention Furui in the specification of the U.S. application.

Attached is a diagram prepared by Mr. Hayakawa, showing the difference between the method of Furui and the method of Hayakawa et al. (Exhibit E) As is apparent from this diagram, according to the method of Furui, voice data of a plurality of speakers are previously held in a system, and an interspeaker distance distribution is obtained from a sample of a distance obtained by giving these data to a true speaker's template.

By contrast, and according to the method of Hayakawa et al., an interspeaker distance distribution is obtained from a sample of a distance obtained by giving an input voice to registered templates of a plurality of others (Speaker 1, 2, ...N).

Relevant Documents: (Exhibit F)

Regarding the second requirement of Item 3 of the Office Action, Applicants conducted a search and a list of documents obtained as a result of the search and deemed relevant is as follows.

- (1) JP06-083386 R
- (2) JP08-241092 R
- (3) JP62-249199 R
- (4) JP08-123475 R
- (5) JP04-305699 R
- (6) JP10-091186

Character of Search

Each prior art collection was searched using the in-house database of Fujitsu Limited. This database contains Japanese publications of other companies in the field related to the

technology of Fujitsu Limited, and domestic applications including all the non-published applications of Fujitsu Limited. Although it is not clear which field is contained in the database, at the least the documents in the field of voice recognition and speaker recognition are contained therein.

ITEMS 4 & 5: REJECTION OF CLAIMS 1, 5 AND 6 FOR ANTICIPATION UNDER 35 USC § 102(b) By ITAKURA

This rejection is respectfully traversed.

The thesis of Itakura relates to "voice recognition" in which phonological information contained in a voice waveform is recognized automatically. In contrast, the present invention relates to "speaker recognition" in which a speaker is recognized automatically using personal information contained in a voice waveform. More specifically, the present invention is largely different from Itakura in both technical field and objects and it is respectfully submitted to patentably distinguish there over.

Itakura relates to a technique regarding "voice recognition", so that the threshold of Itakura is used for determining whether or not a voice is to be recognized (in the case where the voice is not to be recognized, it is considered as a noise), and is not used for determining whether or not a voice is the voice of a registered person as in the present invention.

Furthermore, Itakura relates to a technique of recognizing independent words, by introducing the distance scale of linear prediction analysis (LPC) to Dynamic Programming matching. That is, the distance scale of Itakura is used for obtaining a local distance at each lattice point of Dynamic Programming matching. Itakura uses the spectrum distance of a minimum prediction residual standard for calculating the local distance of Dynamic Programming matching.

In contrast, according to the present invention, the speaker distance between a plurality of prototype models (voices of other registered speakers excluding the registered speaker stored in a speaker storing part) and an input voice is calculated as a global distance of an entire voice, and the speaker of the input voice is authenticated using a probability distribution when the obtained distance is considered as a sample. That is, the "speaker distance calculating part", "distribution estimating part", and "speaker judging part" recited in claim 1 of the present invention are neither disclosed nor suggested by Itakura.

Further features of the invention set forth in the original dependent claims 2-7 and the dependant claims 8-18 presented herein above afford yet further patentably distinguishing recitations over Itakura.

CONCLUSION

In accordance with the foregoing, it is submitted that the objections to the Title and Abstract have been overcome and that the requirement for information has been satisfied. There being no other objections or rejections, it is submitted that the application is in condition for allowance, which action is earnestly solicited.


If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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By: _____


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